

The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

BOUVERIE HOUSE, 154, FLEET STREET, LONDON, E.C.4

Telegrams: ALLANGAS FLEET LONDON

GLASGOW: 116, Hope Street (Central 3970)

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The Personal Factor

THERE has recently fallen into our hands—fallen is perhaps the correct word, for it descended out of the blue—the text of an address by Capt. E. H. Marsh, President of the Leeds Association of Engineers, on the personal factor in engineering. So much is heard to-day of the dominance of the machine which, invented by man, is supposed to be turning industrial men into automata, that it is good to hear one holding high position in the engineering world speak well of the need for taking account of the personal factor even in works where mass production is the rule. For it remains true that we may produce our goods in mass, but we cannot mass-produce our human material. We have read of the Russians being driven forward, or going forward, in thousands to perish in hundreds beneath the guns of the Finnish defenders; as hundreds perish, more thousands advance, and there we have the nearest approach yet seen to a mass-produced army. Yet when we are permitted to read the letters found on the individual men of this cattle-like army we see that they are men like ourselves, with their individual hopes, ambitions, fears, desires.

In the political sphere these thoughts are readily accepted, but are they so readily accepted in the industrial sphere? Is there not a feeling on the part of many managements that the works is all-important and the individual of little importance? For some comparatively trifling difference of opinion, or mistake, or laxity of behaviour, the first impulse is too frequently to ride the high horse; let the man go if he wants to, or sack him if his offence seems to have been glaring—we can get another. In that way the older industrialists lost many of their best men, and often lived to regret that skilled and intelligent workmen and staff had gone to assist their competitors. So Captain Marsh, admitting that we assist our staffs and workmen to become trained engineers, chemists, or what not, says: "Never so far as I am aware have we given consideration to the personal qualities of manhood which are desirable to those who engage in the industry of engineering and particularly in those who may be called upon to exercise direction and control." Too often we are content, he says, to consider that it does not matter what kind of a man a workman may be so long as he does his job. The manager does not hesitate to point out and check the incapacities or lapses of a workman, but he neglects the other factors which are equally far-reaching in their effects on production and on the general success of the company.

It was perhaps never so necessary as now to take care of the personal side of management. In war time, with absence of light after dark and fewer opportunities for relaxation and amusement, nerves become strained. Pressure of work, and shortage of manpower due to the calls of the fighting services, will accentuate the difficulties. It is then that the manager who can create enthusiasm for the work among his men, who can get them to work as a team, shows himself as standing head and shoulders above one who merely drives. This statement does not apply only to the higher management; it applies to every foreman, chief chemist, departmental manager—to everyone in short who has even one man or woman under him. Here is a paragraph from a report of a visit to a factory quoted by Captain Marsh which illustrates the perfect manager: "In this factory one could see the spirit of the men who invented the machines, the spirit of the men who worked them, and the spirit of the man who owned it, all working softly and powerfully, running together. Anyone could have seen why by going into the office and talking to the owner, or even by not talking, by seeing him look up from his desk. He was a man who not only put skylights into his buildings and skylights into his men, but seemed to have a skylight in himself."

This war will see another, and perhaps even longer stage in the levelling-up process which has been going on in modern society ever since England began to be an industrial country. In that process the distinctions which were so marked thirty years ago will largely disappear. Men will hold positions in works and in industry because they are fitted for them; not because they were born for them, or went to a more expensive school than their fellows. One of the attributes of the successful manager in the future will be the ability to solve the personal equation in management. There are workmen, and staff, who are unable to do the work which has been allocated to them; it will generally be found that there is some reason for this inability, and that they will do perfectly good work in another job. That is a particularly important problem of management in wartime, and one in which, as indicated in these columns on previous occasions, the National Institute of Industrial Psychology can help. When difficulties arise with individuals, an attempt to get behind the man's mind and personality will often retain a valuable man for the organisation where brusqueness would have driven him away.

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NOTES AND COMMENTS

Wholesale Price Index Numbers

THE Board of Trade Index Number Table of wholesale prices for February reveals that the index figure for chemicals and oils has risen to 112.7 from 108.7 in January (100 = average for 1930). The corresponding figures for iron and steel are 150.1 (February) and 142.4 (January), and for non-ferrous metals 122.2 and 121.9. The increase of nearly $3\frac{1}{2}$ per cent. for the chemicals and oils group was mainly due to an increase of £6 per ton for soya bean oil and palm kernel oil, representing rises of nearly 20 and 30 per cent., respectively. The price of household soap advanced by about 11 per cent. The only noticeable price change among the miscellaneous items was in respect of rubber, which was about 6 per cent. dearer. In the iron and steel group there were increases, ranging up to 12 per cent., for all the descriptions of iron and steel included in the group, with the exceptions of heavy melting scrap, rainwater pipes, high-speed tool steel and certain descriptions of joists and tinplates, for which prices were unchanged. The index for the group showed an increase of about $5\frac{1}{2}$ per cent. Non-ferrous metal prices were substantially unchanged.

U.S.A. Interest in "Buna"

FANTASTIC rumours have recently been circulated in the United States concerning the interest shown in synthetic rubber by the Standard Oil Company, of New Jersey, which recently purchased the licence rights from the I. G. Farbenindustrie for the production of "Buna." According to these rumours, widely dispersed by German propagandists with the aim of creating the impression in the United States of the immunity of Germany from the Allied blockade, it is already possible, by using the I. G. Farbenindustrie process, to produce synthetic rubber at a cost of sixteen cents a pound. Important tyre factories have already interested themselves in the process, it is claimed, and the Standard Oil Company has already decided to erect immediately a large plant in order to meet

orders received from all quarters. The truth is very different. Competent circles state that the Standard Development Company, a subsidiary of the Standard Oil Company, is investigating the problem more especially from the point of view of production costs. Nothing has yet been decided with regard to the erection of a factory for the production of "Buna," and it has not been proved that the product will cost less than twenty cents a pound. In addition, it has been established that the erection of a factory with an annual production capacity of twenty-five thousand tons of synthetic rubber would mean an expenditure of more than ten million dollars, and the product would in no case be able to compete with natural rubber. The United States could only interest itself seriously in the synthetic products if it met with difficulties in obtaining supplies of natural rubber. At the moment, therefore, the production of synthetic rubber on a large scale has only a theoretical interest.

Export of Chemicals to Turkey

IT is reported by the special correspondent of the *Daily Telegraph* at Ankara that the negotiations between Britain and Turkey for taking up the trade in medicinal and industrial chemicals, of which Germany had for all practical purposes the monopoly, are progressing. Representatives of Boots, Ltd., are now in touch with the local authorities and the importers. It is highly probable that the heavy premiums resting on imports from Britain, about 70 per cent., which constituted the main obstacle, will be reduced and that a satisfactory arrangement will be reached for the supply of these commodities by British manufacturers. The extent to which Germany held this market is clear from the fact that, of a total import of 17,000 tons, valued at £1,080,000, Germany supplied 9,500 tons of a value of £860,000.

Rayon Cellulose from Resinous Wood

A METHOD of overcoming the difficulties generally met with in using a resinous pine for the production of cellulose suitable for rayon manufacture is suggested by F. C. Palazzo (Ital. P. 360,051). His system uses a slight variation of the bisulphite method, the wood being treated in the usual manner, except that the resins in the pulp are eliminated by washing with an alkaline wash before the bisulphite treatment. This is carried out in a liquid containing a proportion of calcium oxide and of free or semi-free sulphur dioxide, combined in such a way that the proportion of sulphur dioxide remains invariable during the whole period of boiling. Bleaching is accomplished in two washings in a bath containing about half free hypochlorous acid and half calcium or sodium salts of this acid. Between the two washings the pulp is treated with an alkaline wash, while after the second it is treated with sulphuric acid. A patent for the use of resinous wood for the manufacture of rayon has also been granted to a German firm, the Schlesische Zellwolle A.G. (F.P. 841,122). The patent points out that it is usual to use a bleached sulphite pulp for this purpose, but explains that unbleached pulp can also be used if it is first washed with alcohol to remove the resins and tannins which cannot be bleached out of the finished rayon fibre. Another solution consists in using an unbleached alkaline pulp instead of sulphite pulp, this being first converted into cellulose xanthate and then spun and bleached by any ordinary bleaching process.

Methane Cracking

Improved Installation in Belgium

AN installation for cracking methane to obtain hydrogen (used for the synthesis of methanol or of methanol-ammonia combinations) has been completed at Remory by the Société Belge de l'Azote. It is characterised by the fact that the cracking takes place at ordinary atmospheric pressure, and without the addition of any heat from outside sources. Parasitic production of lampblack is eliminated.

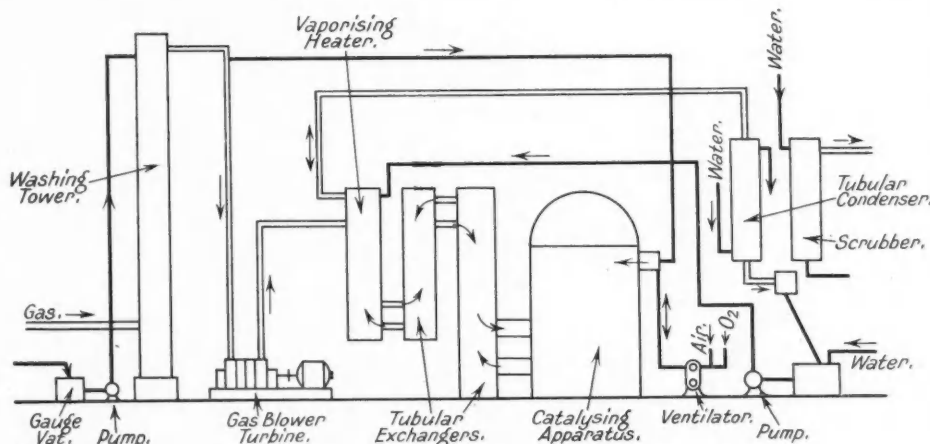
The gas used is a purified coke-furnace gas, obtained by the condensation and fractional distillation of the raw debenzolated coke-furnace gas. Its methane content varies from about 25 per cent. to 90 per cent., according to the exact nature of the gaseous mixture desired after cracking. The gas is first run through a washing tower, to remove any solid impurities it may still contain, and then forced by turbo-blowers into the cracking installation itself. It next passes to a vaporising heater. Here it begins to warm up, taking heat from cracked gas coming from the catalysing apparatus. Into this same vaporiser distilled water is also pumped, to be evaporated by the outgoing hot gas, the vapour being carried along with the methane to be cracked. This first vaporising heater is followed by two further temperature exchangers in which the methane and vapour mixture continues to take heat from the hot cracked gas from the catalysing apparatus. In these three parts of the installation, the incoming methane and the outgoing cracked gas run counter-current so as to provide the most efficient exchange of heat between the two currents of gas.

On entering the catalysing apparatus, therefore, the mixture of methane and vapour has already been heated to a

The first of these two reactions is preponderant, and as it is exothermic it provides the heat necessary to the decomposition of the methane. The methane content of the gas after



Methane Cracking Plant, showing the catalysing apparatus (centre), the temperature exchangers (left) with a portion of the turbo-blowers in front, and the oxygen and air pipes (right).



Schematic Diagram of Methane Cracking Installation.

fairly high temperature. As well as this mixture, oxygen or air is admitted to the input side of the catalyser. Choice of this addition (oxygen or air) depends upon the characteristics required from the cracked gas. In the catalysing apparatus is a simple catalyst. The exact formula of this catalyst is not revealed, but it is said to consist of a mixture of aluminous cement with nickel and/or cobalt nitrate. This is calcined and the oxides reduced to metal by hydrogen. The resultant powder is mixed with black nickel oxide and agglomerated, then heated in an atmosphere of hydrogen to 1000° C. to produce finely divided metal.

Quality of Gas Obtained

The reaction in the catalysing apparatus is as follows: $2\text{CH}_4 + \text{O}_2 = 2\text{CO} + 4\text{H}_2$; and $\text{CH}_4 + \text{H}_2\text{O} = \text{CO} + 3\text{H}_2$.

cracking is less than 1 per cent. The exact nature of the gas produced by the process varies according to the gases supplied to the cracking installation. From 1000 cubic metres of coke-oven gas containing 25 per cent. methane, the process produces 1500 cubic metres of cracked gas, consisting of 71 per cent. hydrogen, 18 per cent. carbon monoxide, 4.5 per cent. carbon dioxide, 0.8 per cent. methane, and 5.7 per cent. nitrogen. From a gas containing 90 per cent. methane, 3000 cubic metres of cracked gas can be obtained, comprising 67 per cent. hydrogen, 22 per cent. carbon monoxide, 7 per cent. carbon dioxide, and 4 per cent. nitrogen with traces of methane. The oxygen required amounts to 450 cubic metres.

ETHYL POLYCHLOROBENZENE

A new highly stable liquid for a variety of industrial uses is reported in *Chemical Industries*, 46, 2 (February, 1940) as having recently been made available in America. The new chemical is composed of approximately equal proportions of ethyl tetrachlorobenzene and ethyl pentachlorobenzene. It can be boiled with aqueous solutions, including 20 per cent. caustic soda or 20 per cent. sulphuric acid, without appreciable change. Boiling range is high, 270° to 320° C. Heating with copper, iron, or aluminium at 200° C. produces no change or corrosion of the metals. Properties of the chemical suggest its application as a heat transfer fluid, as a fluid for pressure control mechanism, as a noninflammable lubricant, or as a dielectric for electric condensers.

The Properties of Animal Fibres

Dyers and Colourists at Manchester

AT a joint meeting of the Manchester Section of the Society of Dyers and Colourists, the Chemical Society, the Manchester Literary and Philosophical Society, and the Manchester Sections of the Institute of Chemistry and Society of Chemical Industry, held last week at the Manchester College of Technology, Professor J. B. Speakman, D.Sc., F.I.C., F.T.I., delivered a lecture on "Some Relationships between the Constitution, Properties and Uses of Animal Fibres."

Twenty years ago, he said, little was known concerning the constitution of animal fibres, such as wool. In consequence, wool textile processes were empirical in character, and there could be no constructive development of new processes. As a result of recent research, however, the structure of animal fibres was now well understood; wool textile processes were capable of scientific control, and new processes could be developed. Orthodox chemical methods could make little progress towards interpreting the structure of the fibre, but X-ray analysis and physico-chemical methods had led to the recognition of a skeleton structure, common to both the cells and the intercellular phase of wool fibre, which was capable of covering all known variations in composition of the fibres and their component parts. According to this conception, the fibre consisted of long peptide chains, arranged parallel to the length of the fibre, and linked together in one plane by cystine and salt linkages. Several such planes were superimposed to form the micelles from which the fibre was built. The processes to which wool was subjected were capable of close interpretation in terms of the above structure.

With regard to dyeing, the salt linkages were responsible for the affinity of animal fibres for acid, but sulphur linkage breakdown at high temperatures facilitated the process by promoting swelling. Sulphur linkage breakdown, when excessive, also hindered shrinkage by impairing the power of recovery of deformed fibres, and the critical conditions for optimum shrinkage—pH 10 and 45° C.—were governed by disulphide bond breakdown. Finally, it was now recognised that the unshrinkable finish on wool was based on gelatinisation of the surface layers of the fibre. Such gelatinisation depended mainly on disulphide bond breakdown, and any reagent capable of causing such breakdown could be used to impart an unshrinkable finish to wool. Chlorine, bromine, sulphuryl chloride, sodium sulphite, chlorine peroxide, etc., all functioned in this manner. From these and other examples it became clear that existing finishing processes were based on the properties of the two types of cross linkage in untreated fibres—the salt linkage and the sulphur linkage. Recent research had, therefore, been devoted to the synthesis of new cross-linkages and a number of types had been established.

Boiler Plant Management

Lecture on Water Treatment at Liverpool

MR. P. HAMER, B.A., of I.C.I. (Alkali), Ltd., gave an address last week at a joint meeting of the Liverpool Sections of the Society of Chemical Industry, British Association of Chemists and Institute of Chemistry, on water treatment and the efficient management of boiler plant. He pointed out that the composition of the raw water supply was the key to most boiler troubles and, while corrosion in storage tanks was difficult to avoid, the application of corrosion-resisting paint to the carefully cleaned metal surface reduced the trouble to a minimum. To protect economisers and pre-heaters against corrosion it was essential to reduce the dissolved oxygen to not more than 0.05 c.c. per litre for boiler pressures up to 450 lb. per sq. in. and to not more than 0.02 c.c. per litre for higher pressures. This could be effected by mechanical deaeration or, chemically, by means of sodium sulphite.

To lessen scale formation it was necessary to apply a

softening treatment to the water before it entered the boiler. Deposition of calcium sulphate could be prevented by Na_2CO_3 , but at pressures above 200 lb. per sq. in. Na_2CO_3 is largely decomposed into CO_2 and NaOH , which latter has no scale-preventing properties. In such cases sodium phosphate may be used and a reserve of 5-10 parts PO_4 per 100,000 in the boiler water was recommended to precipitate calcium entering either through condenser leakage or through accidental variation in softening treatment; sodium phosphate had the further advantage of preventing calcium silicate scale. The problem of caustic embrittlement was, he said, still unsolved, despite the large amount of work done in America, but experience had shown that a ratio $\text{Na}_2\text{SO}_4/\text{NaOH}$ greater than 2.5 should give protection. Dirty steam, due to carry-over of small particles of boiler water, might lead to solid deposits in the superheater or on the turbine blades, and from figures quoted it was possible to calculate the amount of blowdown required. Continuous blowdown, together with continuous sampling and conductivity measurements, were, in the lecturer's opinion, essential for satisfactory boiler operation.

Water Supply Research

New Laboratory Opened

THE Department of Scientific and Industrial Research has opened a new Water Pollution Research Laboratory at Langley Road, Watford, Herts, equipped for work on the problems of water supply, sanitation, and the recovery and utilisation of valuable materials from trade effluents.

Although no central research station has hitherto been available for the Water Pollution Research Board, arrangements have been made for investigations to be carried out in the last few years, on behalf of the Board, in other laboratories, which have led to important results. It has been shown, for example, that by treatment of certain clays and glauconitic sands found in this country, materials can be obtained equal to minerals imported from abroad for use in softening hard water. It has also been discovered that certain synthetic resins can be used to remove dissolved salts and other substances from water. This discovery is being used not only in softening water, and in the production of water containing little or no dissolved substances, but also in the recovery from waste waters of valuable materials, such as copper.

Before the Board was appointed there were many serious cases of pollution of rivers in this country by waste waters from the beet sugar industry. Work in co-operation with the industry has shown that large volumes of waste water, after simple and inexpensive treatment, can be re-used in the factories, with the result that pollution from these sources has been greatly reduced. Another investigation in co-operation with industry has led to the development of methods of treatment and disposal of the waste waters from milk depots, and from factories making butter, cheese and other milk products. The annual value of the materials which can thus be saved in this one industry is several times the annual cost of the whole of the work of the Board.

An investigation now in progress at a branch laboratory in Birmingham, in co-operation with the Birmingham Tame and Rea District Drainage Board, has already indicated that the capacity of percolating filters for treating sewage can be increased by at least 50 per cent. The capital value of filters of this kind in Great Britain is of the order of several million pounds. In the new method of operating these filters, costs of pumping will be increased, but the possible nett saving to the community in the next 30 or 40 years must be assessed in hundreds of thousands of pounds.

In addition to such large-scale investigations, assistance has been given to many organisations and individuals by indicating methods of dealing with problems of water supply, sewage disposal, and the treatment and disposal of trade effluents of many kinds.

Power Alcohol from Molasses

Government Action in India

THE question of the utilisation of molasses—an important by-product of the sugar factories—for the manufacture of power alcohol, has been engaging the attention of the Government as well as the public in India for some years now. The Joint Power Alcohol and Molasses Inquiry Committee, consisting of business men and experts, appointed by the Governments of United Provinces and Bihar in 1939, has reported that the waste surplus of molasses (nearly 200,000 tons) produced annually in vacuum-pan sugar factories in Bihar and the United Provinces can be utilised advantageously for the manufacture of power alcohol. It is estimated that the output would be about 60 gallons of alcohol from a ton of molasses. It is further recommended that for the present only such quantity of power alcohol should be manufactured as could be absorbed in the two provinces with a view to avoid high transportation expenses and to prevent the immediate substitution of the entire quantity of petrol by the power alcohol manufactured from molasses.

Examining the question of cost of the power alcohol, the Committee have satisfied themselves that it will be possible to produce alcohol either by the azeotropic process or the salt dehydration process in a modern plant of a satisfactory large capacity at a cost of about 6 annas or 7d. per gallon. They also found that in a distillery producing power alcohol directly from fermented wash, the cost of manufacture would be reduced by about six pies (½d.) per gallon.

The Government of the United Provinces have agreed with the finding of the Committee that the minimum economic unit for manufacture of power alcohol should be taken to be a plant of a capacity of 2,200 gallons a day. Including distribution and marketing cost and assuming the levy of an excise duty of 10 annas per gallon, it would be possible to sell power alcohol at Rs. 1/3/- (1s. 10d.) per gallon or appreciably cheaper than the price of petrol in places in Bihar and United Provinces where it is sold at about 2s. 3d. to 2s. 6d. per gallon.

Both the Governments are satisfied that the admixture of 20 per cent. of power alcohol with petrol is unobjectionable from the point of view of the motor industry as it would involve no change in the carburettors of motor cars and would be at least equally efficient as motor fuel.

An inquiry Committee appointed by the Madras Government in 1939 has also considered the cost of manufacture of power alcohol and recommended the establishment of this industry in Madras. The Madras Government, like the Governments of the U.P. and Bihar, contemplates introducing legislation providing for the compulsory mixture of power alcohol with petrol.

Compulsory Alcohol Admixture

To the Government of Mysore, one of the most enlightened States in the country, must go the distinction of being the first in India to enact a Power Alcohol Act, the provisions of which came into force from October 1, 1939, in three districts at present (possessing as they do the greater portion of motor vehicles in the State), making the admixture of not more than 25 per cent. of power alcohol compulsory in notified areas. Actually, however, the Act enforces a mixture with petrol of only 15 per cent. of absolute alcohol before such petrol is sold to the public. The Act also prescribes the degree of purity and the fixing of the prices. The manufacture of absolute alcohol to meet the consumption in these three districts is, it is estimated, absorbing about 2,500 tons of molasses produced in the factory of the Mysore Sugar Company at Mandya. The necessary plants have been installed at the distillery to produce absolute alcohol and in

view of the probability of the Act being extended to all the nine districts in the State at no distant date the directors have been taking measures for expanding the capacity of the absolute alcohol plant. Reckoning a 15 per cent. mixture and an annual petrol consumption of 2½ million gallons in the State, the total quantity that the whole State could absorb would be more than 370,000 gallons. The Government of Mysore have, however, been using straight alcohol advantageously without admixture with petrol.

The power alcohol industry has a peculiar significance now when every effort should be made for conserving the country's petrol supplies, and this industry provides one of the best ways of achieving the object and may grow up to be a key industry during the present war.

ANTI-FREEZING GREASE

Air Ministry Material Specification D.T.D. 143c, dealing with Anti-Freezing Grease, demands that the material shall be a solid emulsion of mineral lubricating oil and water-insoluble soap, free from dirt or foreign substances; shall be pale in colour, of smooth texture, and uniform throughout; and shall exhibit no hard particles of impurities when 50 grams are squeezed through 40-mesh muslin or wire gauze. The drop point shall not be below 65° C., the amount of ash shall not exceed 5 per cent., and the loss on heating at 100° C. for 3 hours shall not exceed 5 per cent. The keeping qualities of the material shall be such that when stored in the original sealed containers at ordinary temperatures the material shall retain the required properties for not less than six months.

Standards of consistency, resistance to oxidation, and resistance to hardening are determined by mechanical methods which are described in detail in the Specification. Requisite freedom from acidity and alkalinity are determined by the following methods. In the acidity test, about 0.3 gm. of the material is placed on a white porcelain tile, and three drops of distilled water (pH 6.5-7.0) and one drop of bromocresol purple indicator added. A distinct purple colour should develop on mixing the material with the indicator for two minutes. Similarly the grease should exhibit no alkaline reaction with phenolphthalein when rubbed out on a white porcelain tile after the addition of three drops of water. Copies of the Specification can be obtained from H.M. Stationery Office or through any bookseller, price 6d. (7d. post free).

FIRE-RETARDING TIMBER TREATMENT

The issue of a Standard, in the BS/ARP series, for the testing of incombustible material which is resistant to incendiary bombs (BS/ARP/27), has been followed by the issue of a further standard for testing treatment applied to timber to retard its combustibility. Such treatment could be applied to the members of a roof or attic as a protection against the effect of an incendiary bomb. Briefly, the method involves a comparison of the fire-retarding effect of the material under test with that of a standard silicate paint; the conditions under which the comparative test is made and the results that should be given by a satisfactory material are set out in this Standard. A note at the beginning of the Standard states that the Building Research Station will be prepared to carry out tests for manufacturers of materials. Copies of this new British Standard may be obtained from the British Standards Institution, 28 Victoria Street, London, S.W.1, price 3d. post free.

A Chemist's Bookshelf

RECORDS AND RESEARCH IN ENGINEERING AND INDUSTRIAL SCIENCE, by J. Edwin Holmstrom, B.Sc., Ph.D., A.C.G.I., A.M.Inst.C.E. (London: Chapman and Hall. Pp. xii and 302. 15s.

Anyone who has had to search for information on a single item of technical knowledge should be grateful to Dr. Holmstrom for his work on this volume. He has formulated a technique for exploiting the vast mass of technical knowledge which is available—if only one knew where to find it. Though primarily directed to assisting the engineer, the system outlined is of equal use to any working scientist or technologist. Dr. Holmstrom is fully aware of the interaction of various branches of science in any single industrial process. His chapters include valuable details about research work and where it is being done; an account of the transmutation of its results to commercial uses by technical institutions; and advice to the many smaller firms which form the backbone of British industry. The research of the National Institute of Industrial Psychology into the human material of industry is not forgotten. Sections follow dealing with the collating societies, including chemical societies, with standardising institutions, and with the publication of transactions, though the British Association's new and more convenient method of publishing its proceedings has not been noted.

The most important part of the book is its suggestions as to the gathering of ideas from technical literature, the perusal of which is too generally neglected—very probably owing to the lack of bibliographical organisation. "Organised bibliography," the author justly states, "is a form of insurance against ignorance." We certainly agree with him that an extension of bibliographical records is preferable to Mr. H. G. Wells's suggested "super-encyclopaedia." Due tribute is paid to the valuable work of the Science Library and of A.S.L.I.B.

A clear exposition of indexing systems, instructions on writing articles that would delight the heart of Mr. A. P. Herbert, and invaluable lists of addresses of institutions, technical dictionaries, etc., complete a volume that will be of vast service to every scientist from the time he leaves school, if not before. The end-papers are occupied by an amusing and suggestive "flow-chart" of scientific knowledge.

LES CHALEURS SPECIFIQUES, by Edmond Brun, D.ès Sc. Paris: Armand Colin. Pp. 224. 15 fr. (bound, 17½ fr.).

The knowledge of specific heats is a means, not an end, but their exact determination is one of the most important tasks of physical chemistry to-day. The study of the organisation of a chemical system is greatly facilitated by a knowledge of the heat-measurement data at various temperatures. Professor Brun, by publishing a well-documented study of the results, both theoretical and experimental, of the most recent work in this direction, has placed the necessary facts within convenient reach of his readers; a noteworthy feature is the inclusion of an important section dealing with the anomalous results of certain recently-studied transformation temperatures. This little book will be of special value to chemists, who find a knowledge of specific heats increasingly useful in the study of free energy and of equilibrium constants.

RADIOACTIVITE ET TRANSMUTATION DES ATOMES, by Théodore Kahan, D. ès Sc. Paris: Armand Colin. Pp. 224. 15 fr. (bound 17½ fr.).

Here is another volume in the valuable "Collection Armand Colin" which covers as wide a field of science as do the sections of the British Association. Mr. Kahan has presented, with a succinctness that makes no sacrifice of accuracy, the present state of the investigations into radioactivity and the transmutation of matter—the realisation of the al-

chemist's dream. His book gives a complete account of the recent advances in nuclear physics and the daring theories evolved as a result of experimental work in that branch of science. In these days research into every possible source of energy is of prime importance; hence the interest attaching to the problem of the disintegration of primary matter, on account of the immense potential supply of energy thereby released. This aspect of the subject is the main motive of the volume, but the medical applications of natural and artificial radioactivity are not forgotten.

QUANTITATIVE SPECTROGRAPHIC ANALYSIS WITH THE MICROPHOTOMETER. (Part I. A review of published work), by D. M. Smith, B.Sc., D.I.C., F.Inst.P. London: British Non-Ferrous Metals Research Association. Pp. 24.

Rapid progress in quantitative spectrographic analysis during the last few years has been very largely due to the introduction of the microphotometer. This instrument provides a means of determining the relative blackenings of the lines used in the analysis with a precision far superior to that of visual observations. As a result the standardisation of electrical and optical conditions for routine analysis has been shown to require more rigid control than was formerly considered necessary. It is with the nature and control of the variables encountered in the standardisation of technique that this report is mainly concerned and, for ease of reference, the various aspects of the subject are dealt with under convenient headings. Further sections of the report are concerned with the analysis of non-ferrous alloys, and the data are summarised in tabular form, with reference to a bibliography of 54 publications. This report forms the first of a series; succeeding ones will deal with experimental contributions to the subject from the Association's laboratories.

THERMOMETERS AND PETRI DISHES

The British Standard Specification for General Purpose Laboratory Thermometers, No. 593, has just been revised. The specification includes five series of thermometers for general purposes, the chief change in the revision being the inclusion of a series "E," specially chosen to be suitable for use with distillation flasks specified in B.S.571. The other series specified include thermometers in both Centigrade and Fahrenheit scales for partial and for complete immersion.

The British Standard Specification for Petri Dishes, No. 611, has just been revised by the British Standards Institution. This revision chiefly concerns alterations in the tolerances and in the height and thickness of the top and bottom dish.

Copies of these Specifications may be obtained from the British Standards Institution, 28 Victoria Street, S.W.1., price 2s. each (2s. 2d. post free).

SYNTHETIC SEX HORMONES

A micro-organism recently discovered by the Italian bacteriologists, Arnaudi and Ercoli, has the unique property of promoting the oxidation of dehydroandrosterone to androstendione, an intermediate in the synthesis of the male sexual hormone, testosterone. In this conversion the yield of androsterone is considerably higher than in purely chemical methods. According to A. Ercoli, who gives a preliminary account of the new organism (*Micrococcus dehydrogenans*) in *La Chimica e L'Industria* (January 1940, p. 14), the influence of the new organism upon the oxidation of steroid alcohols to ketones is maintained even after its power of proliferation has been destroyed by heat. It is therefore claimed that this reaction is the first instance of a purely enzymatic dehydrogenation without the actual intervention of living organisms so far experimentally verified in the field of sexual hormone chemistry.

Fuel Committees Appointed

Statement by the Secretary for Mines

IN answer to a question by Mr. Attlee, the Secretary for Mines (Mr. Geoffrey Lloyd) stated last week in the House of Commons that the committee which had been established last December, under the chairmanship of Sir William Bragg, to make a rapid survey of the question of fuel, in the light of war conditions, had now completed its task, and on its recommendations six specific problems were being investigated simultaneously. The problems and the six committees dealing with them were as follows:—

1. Synthetic Processes for the Production of Oil from Coal. to consider and examine the Fischer-Tropsch and similar synthetic processes. Sir William Jowitt (chairman), Mr. James Bowman, Professor C. N. Hinshelwood, Sir Walter Benton Jones, Sir William Larke, Sir Robert Robertson, Mr. George Thomson; and Dr. J. G. King and Dr. W. A. MacFarlane (assessors).

2. Low-Temperature Carbonisation Products and their Utilisation. Lord Henley (chairman), Mr. Gordon Macdonald, Professor W. H. Mills, Mr. W. E. Mortimer, Mr. F. B. Richards, Mr. T. E. B. Young; and Dr. F. S. Sinnatt (assessor).

3. High-Temperature Carbonisation Products and their Utilisation. Mr. J. Davidson Pratt (chairman), Mr. W. Gordon Adam, Mr. S. Billborough, Mr. G. A. Hebden, Mr. A. H. Middleton, Mr. Stanley Robinson, Mr. A. W. Smith, Mr. T. A. Smith; and Mr. J. F. Ronca and Dr. J. G. King (assessors).

4. Alternative Fuels for Internal Combustion Engines. Viscount Ridley (chairman), Mr. A. A. M. Durrant, Mr. J. S. Nicholl, Mr. J. Arthur Reavell, Mr. H. R. Ricardo; and Mr. C. G. Williams, Mr. O. W. J. Watson and Mr. T. F. Hurley (assessors).

5. Colloidal Fuel. Mr. Irvine Geddes (chairman), Mr. S. B. Freeman, Sir Leonard Pearce, Professor E. K. Rideal, Mr. W. J. Drummond, Mr. H. Hicken; and Mr. A. T. Barber and Mr. R. A. Acton Taylor (assessors).

6. The Efficient Use of Fuel in War Time. Sir Clement Hindley (chairman), Captain J. G. Bennett, Dr. E. S. Grumell, Mr. E. G. Hicks, Professor C. H. Lander, Mr. C. A. Masterman, Mr. R. J. Sarjant, Mr. G. B. Sharples, Mr. Johnstone Wright; and Mr. R. Fitzmaurice and Dr. D. T. Davies (assessors).

Interim reports had been asked for wherever possible in order that immediate action might be undertaken.

Recovery of Benzol

Mr. Lloyd said he had received a report indicating that already crude benzol was being recovered at the estimated rate of 15 million gallons a year, and that an extension of voluntary effort should secure a further 12 million gallons a year. He expressed appreciation of what had already been done by voluntary effort, and appealed to those who were not already doing so, to recover all possible benzol. The maximum production of all qualities was urgently required in the national interest. A most valuable survey had been completed showing how our production of tar, creosote and pitch could take the place of imported fuel oil and bitumen to the extent of some 300,000 tons in the current year. Arrangements had already been made to make use of these products in this way. Action already taken would obtain some 32 million gallons of substitutes for imported oil.

In answer to further questions, Mr. Lloyd said that processes for the production of synthetic petrol, including the so-called synthetic oil process, were already under examination, and that methane gas production was likewise being studied. The value of these various processes for practical application on a large scale varied considerably. That was one of the

things being considered at present by practical men as the best way of utilising the processes that were useful.

Mr. Attlee gave notice that, in view of the vital importance of this matter and the need for action, he would raise the subject again at the earliest opportunity.

New Control Orders

Revision of Export Licences

THE Board of Trade has issued the Export of Goods (Control) (No. 8) Order, which came into force on March 18. Changes effected by this Order are as follows:—

(a) Licences will be required for the export to European destinations of andalusite, fibrolite, kyanite, sillimanite and zircon;

(b) Licences will be required for the export to any destination of nearly all non-ferrous metals and alloys thereof in unwrought or semi-manufactured forms (including angles, shapes, sections, pipes and tubes); waste cordage and waste twine; cadmium mass and cadmium sulphide; ethyl morrhuate and sodium morrhuate; and tar oil and other heavy coal tar oils;

(c) Licences will no longer be required for the export of graphite and ammonium chloride to destinations outside Europe.

Iron and Steel Control

The Minister of Supply has made the Control of Iron and Steel (No. 7) (Scrap) Order, 1940, Direction (No. 2) to take effect from April 1, superseding the Direction (No. 1) issued with the Control of Iron and Steel (No. 7) (Scrap) Order, 1940 (S.R. & O., 1940, No. 287).

The issue of the new Direction marks an important change in the method of operation of the control of scrap iron and steel. Hitherto, it has not been necessary for purchasers to obtain licences to acquire iron and steel scrap save for four special grades, but from April 1 any person desiring to acquire scrap iron or steel must be authorised by licence so to do, except in the case of a person (other than one operating an iron or steel works or foundry or forge) who confines his acquisitions to quantities not exceeding in the aggregate one ton from any one person in any one week. This exception has the effect of leaving local authorities and voluntary organisations free to continue house-to-house and other collections of scrap as hitherto. For the time being it is intended to issue general licences to merchants and restricted licences to consumers according to the quality they require.

Chemical Matters in Parliament

Research Expenditure and Income Tax

IN the House of Commons last week Mr. Gledhill asked the Chancellor of the Exchequer whether, in view of the recent increase in Income Tax, he would review the present rules under which expenditure upon research is regarded as capital expenditure and not normally allowable in a profit and loss account for the purposes of assessment, whereas expenditure on such items as advertising is allowable in this connection; and whether, in view of the importance of scientific research to the export trade of this country, he would endeavour to introduce an appropriate remedy in his forthcoming Budget?

Sir J. Simon replied that Mr. Gledhill would not be correct in assuming that in no circumstances would expenditure incurred by a trading concern on research for the purposes of its business be admissible as a deduction in computing its profits for Income Tax purposes. If he had any particular case in mind, and would let him (Sir John) know the facts, he would gladly look into it.

Recent Trade Literature

The current issue of *The Centurion*, house organ of ELLIOTT BROTHERS (LONDON), LTD., scientific instrument makers, contains an interesting article on the growth and development of electric power and lighting at the company's factory, Century Works.

The latest edition of *The Stabiliser*, published by the LINCOLN ELECTRIC COMPANY for those interested in welding, contains the usual numerous letters and photographs dealing with examples of welding from operators throughout the world. In addition there is an interesting article which describes how to weld a cracked mudguard on a motor car.

An interesting feature of a recent issue of *Oxy-Acetylene Tips*, published by the LINDE AIR PRODUCTS CO., New York, in an article giving step-by-step instructions for welding aluminium sheet and plate by means of photographs and sketches. A variety of other articles and features includes details of new developments in welding and cutting apparatus and supplies, how to bronze-weld or fusion-weld cast iron gears without preheating and general instructions for adjusting pressures and operating the blowpipe.

The latest edition of the *Escher Wyss News*, published by the ESCHER WYSS ENGINEERING WORKS, LTD., Zurich, is a special number published on the occasion of the recent Swiss National Exhibition. The purpose of this issue is to show by the example set in research work by Escher Wyss, how advantageous the intentional extension of a manufacturing programme over the whole field of turbo machinery may prove to be in practice. There are articles on research on turbo-machinery, a new method of aerodynamic research, flow phenomena in hydraulic butterfly valves subjected to cavitation, etc.

Great progress has been made in Italy towards independence in the wood pulp field. The main task of carrying out the plan for attaining self-sufficiency in the wood pulp field has been entrusted to two organisations, the I.R.I. and the CARTIERE BURGO who are co-operating in building and completing plants to ensure, within the year 1940, an initial production of over 100,000 metric tons from domestic raw materials. The plan includes the erection of mills at Cuneo, Chieti, Capua and Tresigallo, each with a productive capacity of from 18,000 to 25,000 metric tons. The "Cloro Soda" of Naples is already producing 10,000 metric tons a year from Libyan esparto grass. In 1938 an experimental laboratory was established by the Cartiere Burgo for the study of wood pulp production. The laboratory occupies 70 rooms and covers a total area of 4400 sq. yards. A full description of its facilities is given in an illustrated catalogue recently issued by the Cartiere Burgo.

NEWMAN, HENDER AND CO., LTD., manufacturers of brass, gunmetal and iron valves, cocks and general steam and water fittings, have recently published the latest edition (No. 59) of their catalogue of goods. A handsome bound volume, it contains 392 pages of details and illustrations (many in colour). Several products which have become an important part of the firm's manufacturing programme since the issue of their No. 54 catalogue some ten years ago are illustrated and described for the first time. These include renewable seated valves which can now be supplied with seats and clacks of diamond hard stainless steel (approximately 550/600 Brinell), in addition to those of nickel alloy. The stainless steel is sufficiently hard to crush, without damage to the valve seats and clacks, boiler scale, pipe turnings, etc., which are so prone to be present in all service lines, especially steam. "Newman-Bowler" valves which incorporate the patented "controlled ball" feature and self-aligning reversible and renewable seat ring, are also mentioned. They are particularly suitable for severe steam services, in the case of the gunmetal valves for working pressures to 300 lb. per sq. inch at a total temperature of 600° F. and in the case of cast steel valves for working pressures to 350 lb. per sq. inch at a total temperature of 700° F.

With its effective carrying capacity increased by no less than 40 per cent. to 79 cubic feet, MORRIS MOTORS, LTD.'s popular 5-cwt. van has been re-designed. A leaflet describing the improvements in the new model together with details of a new 10-cwt. van has been issued by the company.

Recent issues of *Electromet Review* published by the ELECTRO METALLURGICAL CO., New York, feature new uses of stainless steel. The remarkable resistance of stainless steel to the corrosive action of sea water is illustrated by details of the stainless steel equipment of a new British cruiser. Details are given also of the application of this metal to furniture and industrial equipment.

Details have recently been issued of a new chemical works erected at Syracuse, New York, for the CHURCH AND DWIGHT CO., INC., manufacturers of bicarbonate of soda. The new factory comprises eight stories and is of face brick with glass block panels instead of windows. Accessibility is the feature of these premises, balconies and staircases providing access to almost every part of the processing equipment utilised in the manufacture of the company's brand of baking soda.

Much useful information is contained in a guide to the fuel requirements of A.R.P. services which has just been published by the BRITISH COMMERCIAL GAS ASSOCIATION. The guide, which is entitled "A.R.P.—A Job for the Gas Industry," lists the needs of various services and the methods of meeting them. Among the subjects covered are the equipment of depots and living quarters, medical services, and canteens. A note is added on street lighting and direction signs, and details are given of the way in which some cleansing stations have been adapted to provide bathing facilities for evacuee children.

A new catalogue featuring gas plant has been issued recently by ASHMORE, BENSON, PEASE AND CO., LTD., who describe the advent of welding and the introduction of Meehanite Metal, for which the company are first licensees in this country, as among the important innovations of the past decade in the construction of gas plant. They state that gasholders of all types and capacities are now supplied either entirely welded or of riveted construction, or a combination of welding and riveting. Welded steel purifiers of the largest capacities have also been designed, fabricated, and erected by the company and are specially adapted for the higher pressures now prevailing in modern gas works practice.

The conception and construction of a mechanical monster, known as the Snow Cruiser, for use in the exploration of the south polar regions, is graphically described in an illustrated booklet recently issued by the RESEARCH FOUNDATION OF THE ARMOUR INSTITUTE OF TECHNOLOGY, Chicago, U.S.A. Towards the end of 1939 an expedition sponsored by the United States Government and known as the United States Antarctic Service Expedition left to explore the unknown regions of Antarctica and the South Pole. With the expedition went the Snow Cruiser which has been specifically designed for Antarctic service and will be used as a mobile base. More than 55 feet long, this mammoth resembles a giant bus and combines the facilities of a modern motor car trailer and a well-equipped scientific laboratory. It carries an aeroplane on its back. The Cruiser will be able to span 15 feet crevasses, climb polar mountains and slide down them on its steel-ribbed body.

FURTHER NEWS HAS BEEN RECEIVED concerning the new Japanese synthetic fibre known as "Synthesis No. 1." This is a vinyl product made by saponifying polyvinyl acetate and spinning the resulting polyvinyl alcohol from alkaline solution in the standard viscose spinning machines. Owing to the poor resistance of polyvinyl alcohol to water, it is necessary to put the fibres through a special water-proofing process. In comparison with nylon the tearing strength (dry) of the fibre is rather low, the respective figures being 3.6 g./den. and 2.5-3.8 g./den.

Lac Research

Reports from London, Ranchi and Brooklyn

INSTITUTIONS dealing with research into the properties and production of shellac have been particularly active recently. Within the last few days we have received the annual Report of the Shellac Research Bureau of the Polytechnic Institute of Brooklyn, sponsored by the U.S. Shellac Importers' Association; Abstracts bearing on Shellac Research Literature, published by the London Shellac Research Bureau; and the annual Report of the Indian Lac Association Committee, Ranchi.

The first of these booklets contains reports of some interesting researches on the properties of lac, including a survey of aqueous solutions of lac applied as varnish, the plastic properties of lac, etc. A study of the constitution of shellac by Dr. Raymond E. Kirk revealed that the components of lac contain at least five acids, in addition to shellolic acid, all except one of which have a distinctly different crystalline form from that of shellolic acid. From the evidence obtained, one of these acids appears to be an isomer of shellolic acid, two are isomers of dihydroshellolic acid, and two are isomers of a homologue of dihydroshellolic acid, $C_{16}H_{24}O_6$. Crystalline dihydroshellolic acid was also prepared. This was done by hydrogenating shellolic acid in a specially designed piece of equipment. A crystalline-hydrazide was prepared from this dihydroshellolic acid. An ester-lactone was synthesised from one of the homologues isolated from lac. This investigation established for the first time that shellolic acid was really one of the constituent acids of lac, and that it was not formed by isomerisation of some other constituent. The total yield of dimethyl shellolate obtained from different lacs amounted to 3.3 to 4.1 per cent. of the entire resin. This was only the second time that shellolic acid had been obtained in any appreciable quantities from lac. In addition, improved methods were developed for preparing both shellolic acid and its dihydrazide from dimethyl shellolate.

The Indian Committee, working under Dr. H. K. Sen, on the spot where the lac is actually produced, have made important studies of soil conditions and pests, as well as chemical researches. The staff and equipment in the chemical section were considerably increased in the year under report. Problems on the constitution of shellac received attention and acetylation, methylation, esterification and hydrogenation, as also the action of ammonia and urea on shellac, were studied. A critical review of the action of halogens was published during the year and attempts at visualising the greater part of the molecule of shellac by careful destructive distillation were also made. A contribution of importance was made on the basicity of pure lac and soft lac resins, the former being di-basic and the latter mono-basic in character. The acid potassium salt of pure resin was isolated and analysed.

Of the Abstracts little need be said except that they are prepared with the usual care and efficiency; they are admirably indexed, and—perhaps most important of all—are printed on one side of the paper only.

A REMARKABLE ANNOUNCEMENT

A note in *Chemical and Chemical Engineering News* (News Ed., 1940, 18, 4, 137) includes the following item from a bulletin issued by the German Library of Information, New York, which it justly describes as "interesting, if true."

"SYNTHETIC HELIUM FOR GERMAN DIRIGIBLES"

"The nation that has blazed a trail for the rest of the world in manufacture and operation of lighter-than-air craft, Germany, will have its own supply of helium within two years. Aeronautical experts agree that German dirigibles will soon be using synthetic helium produced in the Reich for their domestic and international flights.

"Thus, it seems that Germany's reply to U.S. Secretary of Interior, Harold Ickes, will be another scientific marvel. Mr. Ickes, it will be recalled, banned the sale of helium to the Reich. German experts set to work and will soon be ready to produce synthetic helium."

Personal Notes

MR. JAMES STRACHAN has been elected chairman of the Paper Makers' Association's Technical Section, with DR. H. AINSWORTH HARRISON as vice-chairman.

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MR. J. R. JOHNSON has been elected chairman of the Birmingham and Midlands branch of the Institute of Chemistry. MR. T. H. GANT has been elected vice-chairman; DR. W. J. HICKINBOTTOM, hon. treasurer; and MR. E. M. JOINER, secretary.

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SIR HAROLD CARPENTER, Professor of Metallurgy at the Royal School of Mines, London, has been chosen as winner



Sir Harold Carpenter, F.R.S., M.A., Ph.D.

of the Honda Prize—a gold cup and £300—awarded by the Japan Metallurgy Society. He is the first foreigner to be so honoured.

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MR. JOHN VAN NOSTRAND DORR, president of the Dorr Co., of America, and a director of the Dorr-Oliver Co., Ltd., London, S.W.1, was one of a group of American inventors and research scientists who recently received awards from the National Association of Manufacturers in recognition of the contributions they have made to the creation of new jobs, new industries and new standards of living. The ceremony took place at New York and Mr. Dorr was honoured as one of the leading chemical, metallurgical and industrial engineers of America.

OBITUARY

MR. H. FINNIS JOHNSON, a director of Borax Consolidated, Ltd., died last week after a short illness.

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MR. ARTHUR R. ROBERTS, of Penrhiwgoch, Baglan, Briton Ferry, for many years chief metallurgist and chemist to the Briton Ferry Steel Co., died recently, aged 76.

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MR. JOHN M'ROSTIE, of Balgarvie Crescent, Cupar, Fife, died recently at the age of 41. He came to Cupar from Leith 12 years ago and entered the employment of the British Sugar Corporation, Ltd., Prestonhall.

A NEW COMPANY, the Katadyn-Filter A.G., has been registered at Zurich with a nominal capital of 200,000 fr., for the manufacture of filters and other hygienic apparatus. The directors are Ernst Marti, of Rueggisberg, Guido Gerster, of Laufen, and Samuel Alexander Weiss (Hungarian), of Zurich.

Inventions in the Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Applications for Patents

TREATMENT OF HEAVY OIL VAPOURS.—E. Hene, and Trinidad Leaseholds, Ltd. 2897.
 PROCESS FOR THE MANUFACTURE OF HOMOLOGUES OF *d*, *l*-TOCOPHEROLS.—F. Hoffman-La Roche and Co. A.-G. (Switzerland, March 8, '39.) 2917.
 SEPARATION OF LOWER ALKYL ETHER OF CELLULOSE.—L. Mellersh-Jackson (Hercules Powder Co.). 3156.
 MANUFACTURE OF ARYL DIAMINES, including their use in photography and dye manufacture.—Kodak, Ltd. (Eastman Kodak Co.). 3112.
 COLORATION OF ORGANIC MATERIALS.—G. Lord, and G. Reeves. 3273.
 PREPARATION OF THERAPEUTICALLY USEFUL HETEROCYCLIC COMPOUNDS.—May and Baker, Ltd., and H. J. Barber. 3285.
 NICKEL ANODES.—Mond Nickel Co., Ltd., and W. T. Griffiths. 2899.
 METHOD AND APPARATUS for producing sheet material.—Monsanto Chemical Co. (United States, Feb. 16, '39.) 3014.
 MANUFACTURE OF CONTINUOUS SHEETS OF THERMOPLASTIC MATERIAL.—Monsanto Chemical Co. (United States, Feb. 16, '39.) 3015.
 PRODUCTION OF ARTIFICIAL THREADS from viscose.—N. V. Onderzoekingsinstituut Research. (Germany, Feb. 23, '39.) 3216.
 PROCESSES FOR COVERING ALUMINIUM and aluminium alloys or articles composed thereof with an anodic layer.—Rancati S. A. (Italy, Feb. 15, '39.) 2900.
 MANUFACTURE OF INTERMEDIATES.—L. G. Ratner. 2922, 3052.
 PRODUCTION OF MODIFIED ALKYL RESINS.—I. Rosenblum. 3074.
 APPARATUS FOR USE IN EXTRACTION OF FATS.—V. Silberstein. 3020.
 MANUFACTURE OF AZO-DYESTUFFS.—Soc. of Chemical Industry in Basle. (Switzerland, March 8, '39.) 3269; (Switzerland, Jan. 31.) 3270.
 MANUFACTURE OF DYESTUFFS of the phthalocyanine series.—Soc. of Chemical Industry in Basle. (Switzerland, March 13, '39.) 3271.
 PROCESS FOR PURIFYING, separating, and concentrating colloidal dispersions by electrical means.—P. Stamberger. 3203.
 CATALYSTS AND CRACKING and conversion of hydrocarbon oils.—Standard Oil Development Co. (United States, March 22, '39.) 2879.
 FUEL COMPOSITIONS.—Standard Oil Development Co. (United States, March 2, '39.) 2964.
 MANUFACTURE OF SUBSTANCES suitable for use as emulsifying, etc., agents.—Ward, Blenkinsop, and Co., Ltd., B. P. H. Wiesner, and E. Zerner. 3286.
 CONDENSATION PRODUCTS.—Alframine Corporation. (United States, March 1, '39.) 3625.
 METHOD OF MANUFACTURING PROTEIN PRODUCTS and products resulting therefrom.—Atlantic Research Associates, Inc. (United States, March 7, '39.) 3699.
 PRODUCTION OF TRANSPARENT OXIDE COATINGS on aluminium or aluminium alloys.—R. Bosch Ges. (Germany, March 18, '39.) 3693.
 CELLULOSE DERIVATIVES.—British Celanese, Ltd. (United States, Feb. 28, '39.) 3703, 3704.
 MANUFACTURE OF VISCOS.—Carbonisation et Charbons Actifs. (France, Feb. 24, '39.) 3427.
Complete Specifications Open to Public Inspection
 PROCESS FOR THE PROTECTION OF INSECTICIDES.—Soc. des Usines Chimiques Rhone-Poulenc. July 22, 1938. (Cognate Application, 19140/39.) 19139/39.
 TREATMENT OF GASES with pulverulent substances.—Ballag-Meguim A.-G. July 23, 1938. 19309/39.
 MANUFACTURE OF AZO-DYESTUFFS.—Soc. of Chemical Industry in Basle. July 22, 1938. (Cognate Application, 21082/39.) 21081.
 PROCESS FOR HYDRATING ACETYLENE DERIVATIVES of the cyclopentanopolyhydrophenanthrene series.—Soc. of Chemical Industry in Basle. July 23, 1938. (Cognate Applications, 21084-5/39.) 21083/39.
 PROCESS FOR MANUFACTURING VEGETABLE PROTEINS.—H. Iwamae. July 26, 1938. 21190-1/39.
 PROCESS FOR MANUFACTURING PROTEIN FIBRES.—H. Iwamae. July 26, 1938. 21192/39.
 PRODUCTION OF FAST TINTS on cellulose fibres.—Soc. of Chemical Industry in Basle. July 25, 1938. (Cognate Application, 21204/39.) 21203/39.
 MANUFACTURE OF AROMATIC SULPHONES.—I. G. Farbenindustrie. July 23, 1938. 21369/39.
 PROCESS FOR THE PRODUCTION OF ARTIFICIAL BODIES from protein. A.G. für Vermögensvertretung. July 23, 1938. (Cognate Application, 21371/39.) 21370/39.
 MANUFACTURE OF WATER-SOLUBLE CONDENSATION PRODUCTS.—I. G. Farbenindustrie. July 25, 1938. 21482/39.

SYNTHETIC RESINS.—E. I. du Pont de Nemours and Co. July 22, 1938. 21491/39.
 CELLULOSE DERIVATIVES.—British Celanese, Ltd. July 26, 1938. (Cognate Application, 21705/39.) 21704/39.
 PRODUCTION OF DOUBLE FLUORIDES OF ALKALI METALS AND ALUMINIUM.—H. W. Heiser. July 29, 1938. 37300/38.
 MANUFACTURE OF BENZENE SULPHONIC ACID DERIVATIVES.—I. G. Farbenindustrie. March 8, 1938. 5817/39.
 PROCESS AND APPARATUS for the RECTIFICATION of IMPURE ALCOHOLIC LIQUIDS.—Dizem S. A. July 27, 1938. 7282/39. Cognate Application, 7283/39.
 MANUFACTURE OF CATALYSTS, and the treatment of hydrocarbons therewith.—Standard Oil Development Co. May 20, 1938. 8152/39.
 ALKYLATION OF HYDROCARBONS.—Texaco Development Corporation. July 29, 1938. 15416/39.
 PROCESS FOR THE PRODUCTION OF HYDROXYLAMINE SALTS.—I. G. Farbenindustrie. July 29, 1938. 17889/39.
 PROCESS FOR OBTAINING CRYSTALLINE MATERIAL FROM TAR OILS.—Rutgerswerke A.-G. July 30, 1938. 19739/39.
 PROCESS FOR THE MANUFACTURE OF THE CORTICOTROPIC HORMONE.—Schering A.-G. July 29, 1939. 20551/39.
 METHOD OF PRODUCING POROUS CERAMIC BODIES.—Compagnie Générale d'Electro-Céramique. July 30, 1938. 20662/39.
 MANUFACTURE OF UREA CHLORIDES AND ISOCYANIC ACID ESTERS.—Deutsche Hydrierwerke A.-G. July 27, 1938. 21373/39.
 MANUFACTURE OF DERIVATIVES OF OXY-AZO-COMPOUNDS.—Soc. of Chemical Industry in Basle. July 27, 1938. 21435/39.
 MANUFACTURE OF CHLORINATED BROMOMETHANES.—I. G. Farbenindustrie. July 28, 1938. 21706/39.

Specifications Accepted with Date of Application

TREATMENT OF SOYA BEANS.—W. J. Plews. Nov. 27, 1937. 517,997.
 POLYVINYL ACETAL RESIN COMPOSITIONS.—British Thomson-Houston Co., Ltd. Aug. 31, 1937. 518,006.
 VINYL TYPE RESIN COMPOSITIONS.—Armour and Co. Nov. 12, 1937. 518,027.
 REGENERATION OF PROTEIN ANIMAL SUBSTANCES, fibroins, and sericins.—S. A. Brevetti Mario Piacenza. Sept. 18, 1937. 517,956.
 PROCESS FOR THE MANUFACTURE OF COMPOUNDS of the cyclopentanopolyhydrophenanthrene series.—Schering A.-G. Sept. 18, 1937. 518,043.
 MANUFACTURE OF ETHYLENE DERIVATIVES.—Boots Pure Drug Co., Ltd., W. F. Short, and H. H. L. Levene. Sept. 21, 1938. 518,149.
 POLYMERISATION OF OLEFINS.—I. G. Farbenindustrie. Oct. 20, 1937. 518,054.
 PROCESS FOR THE MANUFACTURE OF THERMO-SETTING SYNTHETIC RESINS by the condensation of alkylene oxides with anhydrides of polybasic acids.—De Trey Freres Soc. Anon. Aug. 23, 1938. (Samples furnished.) 518,057.
 PRESERVATION OF RUBBER, oils, and other oxidisable substances. T. A. Clayton (United States Rubber Co.) Jan. 12, 1939. 518,158.
 METHOD OF OPERATING A POLYMERISATION PLANT for hydrocarbon mixtures containing olefins.—Sinclair Refining Co. June 23, 1937. 518,163.
 PRODUCTION OF UREA-FORMALDEHYDE MOULDING-MIXTURES.—J. E. H. Hayward, and Bakelite, Ltd. May 21, 1938. (Cognate Application, 14880/39.) 518,321.
 CRACKING AND REFINING HYDROCARBON OILS.—E. A. Ocon. July 12, 1938. 518,263.
 PROCESS FOR THE MANUFACTURE OF PROGESTERONE.—Chinoin Gyógyszer és Vegyeszeti Termékek Gyára R.T. (Dr. Kereszty and Dr. Wolf), and H. Bretschneider. July 21, 1938. 518,266.
 DESULPHURISING MOTOR BENZOL.—Gewerkschaft M. Stinnes. Sept. 8, 1937. 518,171.
 METHOD OF PRODUCING HYDROGEN PEROXIDE from solutions.—H. Schmidt. Aug. 18, 1938. 518,191.
 PRODUCTION OF PHOSPHATIDE PRODUCTS which are soluble or readily dispersible in water.—R. Kimbara, and W. Rosenthal. (Samples furnished.) Sept. 6, 1937. 518,194.
 MANUFACTURE OF SOLUBLE LEAD SALTS.—W. J. Tennant (L. R. Birkenstein). Aug. 18, 1938. 518,236.
 COMPOSITIONS FOR USE AS INSECT SPRAYS.—W. J. Tennant (Dow Chemical Co.). Aug. 18, 1938. 518,195.
 MANUFACTURE OF ARALKYL ETHERS OF POLYSACCHAROSES.—I. G. Farbenindustrie. Aug. 18, 1937. 518,197.
 PROCESS FOR THE MANUFACTURE OF POLYAZO DYESTUFFS.—I. G. Farbenindustrie. (Samples furnished.) Aug. 19, 1937. 518,243.
 WORM PRESS for separating viscous resinous substances from liquids of lower viscosity.—I. G. Farbenindustrie. Aug. 19, 1937. 518,244.
 PURIFICATION OF ZINC SALT SOLUTIONS.—A. Carpmel (I. G. Farbenindustrie). Aug. 19, 1938. 518,245.
 SEPARATION OF BENZOL FROM COKE OVEN AND LIKE GASES.—G. Maiuri. Aug. 22, 1938. 518,368.

General News

WOMEN MEMBERS of the Institute of Patentees are to be eligible for election to the council, according to a resolution recently passed at a council meeting.

THE EMPLOYEES OF Messrs. Duncan Stewart and Co., Ltd., London Road, Ironworks, Glasgow, contributed £199 to local charitable institutions during the past year.

MESSRS. SANDEMAN BROTHERS, LTD., oil distillers and refiners, are to build an extension to their premises at Ruchill Oil Works, Glasgow.

THE BARRHEAD DEAN OF GUILD COURT has granted permission to the Yorkshire Copper Works, Ltd., tube manufacturers, to erect an extension to a warehouse at their Barrhead works.

PROSPECTING LICENCES granted under the Petroleum (Production) Act to Steel Bros. & Co., Ltd., in Derbyshire, Yorkshire, Lancashire and Cheshire, have been renewed by the Mines Department.

MESSRS. FUMIGATION SERVICES, LTD., of 20-21 St. Dunstons Hill, London, E.C.3, announce that on and after April 1 their address will be Pylon Works, Hertford Road, Barking, Essex. (Telephone: RIPpleway 2451).

OWING TO THE EXPANSION of their sales organisation in Scotland, the Brush Electrical Engineering Co., Ltd., Loughborough, have opened new offices at 97 Waterloo Street, Glasgow, C.2. (Tel.: Central 1809). Mr. G. B. C. Henderson has been appointed Scottish representative.

THE ANNUAL REPORT of the Newcastle-on-Tyne Chamber of Commerce states that lead manufacturers continue to consolidate their position in export markets in spite of quota and exchange difficulties. Domestic consumption was at a high level for white lead, red lead and lead paints. The sheet lead and lead pipes trade was busily engaged on chemical industry orders.

ACCORDING TO THE Board of Trade returns for the month ended February, imports of chemicals, drugs, dyes and colours into the United Kingdom were valued at £1,578,884, an increase of £452,707 as compared with 1939. Exports were valued at £2,422,442, an increase of £734,130 as compared with 1939. Re-exports were valued at £62,448.

OF THE TWO PAPERS read at the recent meeting of the Manchester and District Section of the Institution of the Rubber Industry, the first was entitled "An Investigation of the Influence of Variables on the T.50 Value," and was presented by Dr. E. R. Gardner. The second paper, on "Electrical Tests and Problems Associated with Cure," was read by Mr. J. R. S. Waring. Both were copiously illustrated by slides.

THE FOLLOWING FIRMS have been admitted to membership of the Glasgow Chamber of Commerce: Messrs. Emery Oils, Ltd., oil manufacturers, Shieldhall; Barrhead Kid Co., Ltd., Gateshead Works, Barrhead; Messrs. James Park and Co., Ltd., bleachers, River Road, Carnyle; Messrs. Miller and Ferguson, Ltd., rubber manufacturers, Kenmore Works, Bishopbriggs; Messrs. John Frew and Son, Ltd., silk manufacturers, Strathaven.

IN ORDER TO ENCOURAGE the acquirement of war savings certificates by employees, Messrs. English China Clays, Loversing Pochin and Co. have offered one free certificate for every fifty taken up by groups of their workers in Cornwall and Devon, the free certificates to be balloted for by the members of the various groups formed. The scheme is entirely voluntary and is to be managed by the members themselves, and a number of groups are already in operation.

Foreign News

THE SOCIÉTÉ DES PRODUITS CHIMIQUES de France has gone into compulsory liquidation.

RUBBER FOR TYRES is being rationed in Germany. Every-driver now has to carry a rubber ration card, which must be presented whenever repairs and exchange of tyres or inner tubes are necessary.

THE MEXICAN MINISTER OF FINANCE has stated that Mexico's first plant for the production of lead tetraethyl will shortly start production. It is claimed that Mexico will not only be able to cover her own demands for lead tetraethyl, but will also be able to export.

From Week to Week

THE SPECIAL SUPPLEMENTARY DUTIES on zinc white, lithopone and other white paints with a zinc content, imported into Holland, have been extended to August 31, 1940.

IN THE NEAR FUTURE the Tobacco and Match Monopoly of the Tunisian Government will purchase, by contract, 20,000,000 boxes of matches.

A COMPANY WITH A CAPITAL of ninety million pesetas is to be formed for the erection and operation of a cellulose factory at Torrelavega (Santander), Spain.

THE DISCOVERY IN JAPAN of a process for the reclamation of magnesium from sea water is claimed by Dr. Hiroshi Suzuki, director of the Sea Water Experimental Laboratory attached to the Meiji Mining Industry Company. No details of the process, however, have been announced.

THE PRICE OF FORMIC ACID in Ceylon was stated, on good authority, in our issue of March 2, to have risen by 400 per cent. It should be made perfectly clear that this rise in price is not due to the increase on the part of British suppliers. The f.o.b. price of formic acid has not been increased since the war began, though the c.i.f. price has naturally been raised owing to higher freight costs and war risk insurance. Even so, the present c.i.f. duty paid selling price is only about £63 12s. per ton as compared with the pre-war price of about £58 8s. It is very probable, however, that owing to the local shortage due to the cutting-off of German supplies, internal prices in the bazaars have been forced up.

Forthcoming Events

A MEETING OF THE INSTITUTION OF THE RUBBER INDUSTRY, London and District Section, will be held on April 1, at The Northumberland Rooms, Northumberland Avenue, W.C.2, at 7.15 p.m., when the following paper will be read: "Costing in Relation to Factory Control and Administration," by Mr. F. C. Lawrence, M.C., B.Sc. Tech., A.M.I.E.E., F.C.W.A.

A GENERAL MEETING of the Institution of Automobile Engineers will be held in the Hall of the Royal Society of Arts, John Street, Adelphi, London, W.C.2, on Tuesday, April 2, at 6.15 p.m. Mr. E. C. Toghill and Mr. R. V. Dowle will read a paper entitled "Applications of Cast Iron in Modern Automobile Construction."

A MEETING OF THE Society of Public Analysts and Other Analytical Chemists will be held at 5.30 p.m. on April 3, at the Chemical Society's Rooms, Burlington House, Piccadilly, London, W.1. The following papers will be read and discussed: Hair Dyes. Part II. The Functions and Reactions of Phenols (to be illustrated by a cine-film in colour), by H. E. Cox, D.Sc., Ph.D., F.I.C. The Determination of Aluminium, Magnesium and Beryllium in Nickel Alloys, by R. C. Chirside, F.I.C., L. A. Dauncey, B.Sc., and P. C. M. Proffitt.

THE ANNIVERSARY MEETING (99th annual general meeting) of the Chemical Society will be held at Burlington House, London, W.1, on April 4, at 2.30 p.m. The following functions will be open to Fellows and visitors: at 3 p.m. (approximately) the President, Sir Robert Robinson, M.A., D.Sc., LL.D., F.R.S., will deliver his Presidential Address entitled: "Some Biological Aspects of Organic Chemistry," including "Recent Progress in Chemotherapy," and "Structural Relations in the Sterol Group"; at 5 p.m. Professor E. K. Rideal, M.B.E., M.A., D.Sc., F.R.S., will deliver the Sørensen Memorial Lecture. Tickets will not be required.

AFTER THE GENERAL MEETING of the Illuminating Engineering Society (1930), to be held on April 9, at 5.30 p.m., at the E.I.M.A. Lighting Service Bureau, 2 Savoy Hill, W.C.2, a paper entitled "The Photometric Properties of Luminescent Materials," by W. E. Harper, Ph.D., B.Sc., Margaret B. Robinson and J. N. Bowtell, B.Sc., will be read at 6.30 p.m., and will be followed by a discussion.

THE SPRING MEETING of the British Ceramic Society (Pottery Section) will be held at the North Staffordshire Technical College, Stoke-on-Trent, on April 22. Papers will deal with Modern Slip-House Practice. The morning session will open at 10.30 a.m., and adjourn at 12.15 p.m. for luncheon at the Grand Hotel, Hanley (12.45). The afternoon session will start at 2.30 p.m.

Weekly Prices of British Chemical Products

AS is customary following a holiday period most sections of the general chemical market have been in the process of settling down during the past week and consequently the volume of inquiry has been rather restricted. A fair demand has been circulating for chlorate of soda and most of the soda compounds are in steady request; the acid section also has attracted a fair amount of attention. There are no important price changes to record and values generally remain steady with a firm undertone. The market for coal tar products has also resumed business on rather quiet lines and there are no special features on which to comment. The price position on the whole has remained unaltered.

MANCHESTER.—Although the Manchester chemical market this week opened relatively quiet after the holidays the undertone is good in virtually all departments and price conditions are firm. Contract deliveries have been resumed on a fairly active scale and there is a steady movement into consumption of most of the soda products and also of a wide range of miscellaneous chemicals. New bookings on the tar products market locally have so far been very moderate, although here again renewed activity is looked for when trading has got back fully into its stride. A certain

amount of easiness is reported in the case of cresylic acid, but in most other directions values continue on a strong basis.

GLASGOW.—There is little to report during the past week owing to the intervention of holidays. Few changes have occurred and the demand for all heavy chemicals continues to be substantial, with firm prices for all commodities.

Price Changes

Falls: Cresylic Acid (Manchester).

* In the case of certain products, here marked with an asterisk, the market is nominal, and the best ascertainable prices have been scheduled. At present all intermediates are included under this head.

General Chemicals

Acetic Acid.—Maximum prices per ton: 80% technical, 1 ton £34 15s.; 10 cwt./1 ton, £35 15s.; 4/10 cwt., £36 15s.; 80% pure, 1 ton, £36 15s.; 10 cwt./1 ton, £37 15s.; 4/10 cwt., £38 15s.; commercial glacial, 1 ton, £44; 10 cwt./1 ton, £45; 4/10 cwt., £46; delivered buyers' premises in returnable barrels. £4 per ton extra if packed and delivered in glass.

Acetone.—Maximum prices per ton, 50 tons and over, £49 10s.; 10/50 tons, £50; 5/10 tons, £50 10s.; 1/5 tons, £51; single drums, £52, delivered buyers' premises in returnable drums or other containers having a capacity of not less than 45 gallons each; delivered in containers of less than 45 gallons but not less than 10 gallons £10 10s. per ton in excess of maximum prices; delivered in containers less than 10 gallons each £10 10s. per ton in excess of maximum prices, plus a reasonable allowance.

***Alum.**—Loose lump, £8 7s. 6d. per ton d/d.

***Aluminium Sulphate.**—About £8 per ton f.o.b. Liverpool.

Ammonia Anhydrous.—99.95%, 1s. to 2s. per lb., according to quantity in leased cylinders, carriage paid; less for important contracts.

Ammonium Carbonate.—£32 £36 per ton d/d in 5 cwt. casks.

Ammonium Chloride.—Grey galvanising, £18 per ton, in casks, ex wharf. See also Salammoniac.

***Antimony Oxide.**—£68 per ton.

Arsenic.—99/100%, about £25 per ton, ex store.

Barium Chloride.—98/100%, prime white crystals, £11 10s. 0d. to £13 per ton, bag packing, ex works; imported material would be dearer.

Bleaching Powder.—Spot, 35/37% £10 per ton in casks, special terms for contract.

Borax, Commercial.—Granulated, £20 10s. per ton; crystal, £21 10s.; powdered, £22; extra finely powdered, £23; B.P. crystals, £29 10s.; powdered, £30; extra fine, £31 per ton for ton lots in free 1-cwt. bags, carriage paid in Great Britain. Borax Glass, lump, £64; powder, £65; in tin-lined cases for home trade only, packages free, carriage paid in Great Britain.

Boric Acid.—Commercial granulated, £34 10s. per ton; crystal £35 10s.; powdered, £36 10s.; extra finely powdered, £38 10s.; large flakes, £47; B.P. crystals, £43 10s.; powdered, £44 10s.; extra fine powdered, £46 10s. per ton for ton lots, in free 1-cwt. bags, carriage paid in Great Britain.

Calcium Bisulphite.—£7 10s. per ton f.o.r. London.

***Calcium Chloride.**—GLASGOW: 70/75% solid, £5 12s. 6d. per ton ex store.

Charcoal Lump.—£10 to £12 per ton, ex wharf. Granulated £11 to £14 per ton according to grade and locality.

***Chlorine, Liquid.**—£19 15s. per ton, d/d in 16/17 cwt. drums (3-drum lots); 4½d. per lb. d/d station in single 70-lb. cylinders.

Chrometan.—Crystals, 4d. per lb.; liquor, £19 10s. per ton d/d station in drums. GLASGOW: Crystals 4d. per lb. in original barrels.

Chromic Acid.—1s. per lb., less 2½%; d/d U.K. GLASGOW: 1s. 0½d. per lb. for 1 cwt. lots.

Chromic Oxide.—Green, 1s. 4d. per lb., d/d U.K.

Citric Acid.—1s. 2d. per lb. MANCHESTER: 1s. 3d.

***Copper Sulphate.**—Nominal.

Cream of Tartar.—100%, £5 2s. to £6 7s. per cwt., less 2½%. Makers' prices nominal, imported material about £170 per ton to quantity, d/d in sellers' returnable casks; imported material would be dearer.

Formic Acid.—85%, £44 10s. per ton for ton lots, carriage paid, carboys returnable; smaller parcels quoted at 46s. 6d. to 49s. 6d. per cwt., ex store.

Glycerine.—Chemically pure, double distilled, 1,260 s.g., in tins, £3 10s. to £4 10s. per cwt. according to quantity; in drums, £3 2s. 6d. to £3 16s. 0d. Refined pale straw industrial, 5s. per cwt. less than chemically pure.

Hexamine.—Technical grade for commercial purposes, 1s. 4d. per lb.; free-running crystals are quoted at 1s. 7½d. to 1s. 10½d. per lb.; carriage paid for bulk lots.

Hydrochloric Acid.—Spot, 6s. 1½d. to 8s. 7½d. carboy d/d according to purity, strength and locality.

Iodine.—Resublimed B.P., 9s. 2d. to 13s. per lb., according to quantity.

Lactic Acid.—(Not less than ton lots). Dark tech., 50% by vol., £30 10s. per ton; 50% by weight, £35; 80% by weight, £60; pale tech., 50% by vol., £36; 50% by weight, £42; 80% by weight, £67. One ton lots ex works; barrels returnable.

Lead Acetate.—White, £48 to £50, ton lots.

Lead Nitrate.—About £44 per ton d/d in casks.

Lead, Red.—English, 5/10 cwt., £41 10s.; 10 cwt. to 1 ton, £41 5s.; 1/2 tons, £41; 2/5 tons, £40 10s.; 5/20 tons, £40; 20/100 tons, £39 10s.; over 100 tons, £39 per ton, less 2½ per cent., carriage paid; non-setting red lead, 10s. per ton dearer in each case; Continental material, £1 per ton cheaper.

Lead, White.—Dry English, less than 5 tons, £51; 5/15 tons, £47; 15/25 tons, £46 10s.; 25/50 tons, £46; 50/200 tons, £45 10s. per ton, less 5% carriage paid; Continental material, £1 per ton cheaper. Ground in oil, English, 1/5 cwt., £59 10s.; 5/10 cwt., £58 10s.; 10 cwt. to 1 ton, £58; 1/2 tons, £56 10s.; 2/5 tons, £55 10s.; 5/10 tons, £53 10s.; 10/15 tons, £52 10s.; 15/25 tons, £52; 25/50 tons, £51 10s.; 50/100 tons, £51 per ton, less 5% carriage paid. Continental material £2 per ton cheaper.

Litharge.—1 to 2 tons, £41 per ton.

Magnesite.—Calcined, in bags, ex works, about £12 to £15 per ton.

Magnesium Chloride.—Solid (ex wharf), £12 per ton.

***Magnesium Sulphate.**—Commercial, £5 10s. per ton, ex wharf.

Mercury Products.—Controlled prices for 1 cwt. quantities: Bichloride powder, 9s. 1d.; bichloride lump, 9s. 8d.; bichloride ammon. powder, 10s. 7d.; bichloride ammon. lump, 10s. 5d.; mercurous chloride, 10s. 11d.; mercury oxide, red cryst., B.P., 12s. 3d.; red levig. B.P., 11s. 9d.; yellow levig. B.P., 11s. 7d. ***Methylated Spirit.**—61 O.P. industrial, 1s. 5d. to 2s. per gal.; pyridinised industrial, 1s. 7d. to 2s. 2d.; mineralised, 2s. 6d. to 3s. Spirit 64 O.P. is 1d. more in all cases and the range of prices is according to quantities.

***Nitric acid.**—Spot, £19 to £26 per ton, according to strength, quantity and destination.

Oxalic Acid.—From £60 per ton for ton lots, carriage paid, in 5-cwt. casks; smaller parcels would be dearer; deliveries slow.

***Paraffin Wax.**—Nominal.

Potash, Caustic.—Liquid, £30 to £35 per ton, according to quantity.

Potassium Bichromate.—5½d. per lb. carriage paid. GLASGOW: 5½d. per lb., carriage paid.

Potassium Chlorate.—Imported powder and crystals, ex store London, 10d. to 1s. per lb.

Potassium Iodide.—B.P., 8s. to 11s. 2d. per lb., according to quantity.

Potassium Nitrate.—Small granular crystals, £26 to £29 per ton ex store, according to quantity.

Potassium Permanganate.—B.P., 1s. 4½d. to 1s. 5½d. per lb.; commercial, £7 9s. 6d. to £8 1s. 6d. per cwt., according to quantity, d/d.

Potassium Prussiate.—Yellow, about 1s. 2d. to 1s. 5d. per lb., supplies scarce.

Salammoniac.—Dog-tooth crystals, £45 per ton; medium, £43 10s.; fine white crystals, £16 10s.; in casks, ex store.

Soda Ash.—Light 98/100%, £6 2s. 6d. per ton f.o.r. in bags.

Soda, Caustic.—Solid, 76/77% spot, £14 per ton d/d station.

Soda Crystals.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.

Sodium Acetate.—£37 to £40 per ton, ex wharf.

Sodium Bicarbonate.—About £10 10s. to £11 10s. per ton, in bags.

Sodium Bichromate.—Crystals, 4½d. per lb., net d/d U.K. with rebates for contracts. GLASGOW: 5½d. per lb., carriage paid.

Sodium Bisulphite Powder.—60/62%, £16 per ton d/d in 2-ton lots for home trade.

Sodium Carbonate Monohydrate.—£20 per ton d/d in minimum ton lots in 2 cwt. free bags.

Sodium Chlorate.—£32 to £39 per ton, d/d, according to quantity.

Sodium Hyposulphite.—Pea crystals, £16 17s. 6d. per ton for 2-ton lots; commercial, £13 10s. per ton. MANCHESTER: Commercial, £13; photographic, £16 10s.

Sodium Iodide.—B.P., for not less than 28 lb., 8s. 10d. per lb.; for not less than 7 lb., 10s. 9d. per lb.

***Sodium Metasilicate.**—£14 5s. per ton, d/d U.K. in cwt. bags.

Sodium Nitrate.—Refined, £9 10s. to £10 per ton for 6-ton lots d/d.

Sodium Nitrite.—£18 15s. per ton for ton lots.

Sodium Perborate.—10%, £4 10s. per cwt. d/d in 1-cwt. drums.

Sodium Phosphate.—Di-sodium, £16 to £17 per ton delivered for ton lots. Tri-sodium, £18 per ton delivered per ton lots.

Sodium Prussiate.—From 6d. per lb. ex store.

Sodium Silicate.—£8 2s. 6d. per ton, for 4-ton lots.

***Sodium Sulphate (Glauber Salts).**—£4 10s. per ton d/d.

Sodium Sulphate (Salt Cake).—Unground spot, £4 1s. per ton d/d station in bulk. MANCHESTER: £4.

Sodium Sulphate.—Solid 60/62%, Spot, £13 15s. per ton d/d in drums; crystals, 30/32%, £9 10s. per ton d/d in casks. MANCHESTER: Concentrated solid, 60/62%, £13; crystals, £9 15s.

***Sodium Sulphite.**—Pea crystals, spot, £16 per ton d/d station in kegs.

***Sulphur Precip.**—B.P., £55 to £60 per ton according to quantity. Commercial, £50 to £55.

Sulphuric Acid.—168° Tw., £5 7s. to £5 17s. per ton; 140° Tw., arsenic-free, £3 15s. to £4 5s.; 140° Tw., arsenious, £3 7s. 6d.

Tartaric Acid.—1s. 6½d. per lb., less 5%, carriage paid for lots of 5 cwt. and upwards. Makers' prices nominal; imported material 2s. 3d. to 2s. 6d. per lb., ex wharf. MANCHESTER: 1s. 7d. per lb.

Zinc Oxide.—Maximum prices: White seal, £30 17s. 6d. per ton; red seal, £28 7s. 6d. d/d; green seal, £29 17s. 6d. d/d buyers' premises.

Zinc Sulphate.—Tech., about £25, carriage paid, casks free.

Rubber Chemicals

Antimony Sulphide.—Golden, 9½d. to 1s. 6½d. per lb., according to quality. Crimson, 1s. 8d. to 1s. 11d. per lb.

Arsenic Sulphide.—Yellow, 1s. 6d. to 1s. 8d. per lb.

Barytes.—Imported material £6 to £9 per ton according to quality.

Carbon Black.—About 7d. to 7½d. per lb., according to quantity.

Carbon Bisulphide.—£31 to £36 per ton, according to quantity, in free returnable drums.

Carbon Tetrachloride.—£50 to £55 per ton, according to quantity, drums extra.

India-rubber Substitutes.—White, 5½d. to 6½d. per lb.; dark 5½d. to 6d. per lb.

Lamp Black.—Imported material is quoted at about £35 to £40 per ton.

Lithopone.—30%, £18 17s. 6d. per ton; 60%, £31 to £32 per ton. Imported material would be dearer.

Sulphur.—Finely powdered, about £15 per ton, delivered.

Sulphur Chloride.—6d. to 8d. per lb., according to quantity.

Vegetable Black.—£35 per ton upwards; 28/30%, £15 10s. 0d.; 60%, £29, delivered buyers' premises.

Vermilion.—Pale or deep, 8s. 5d. per lb., for 7 lb. lots.

Zinc Sulphide.—About £63 per ton ex works.

Plus 5% War Charge.

Nitrogen Fertilisers

Ammonium Sulphate.—Per ton in 6-ton lots d/d farmer's nearest station, March/June, £9 6s.

Calcium Cyanamide.—£12 10s. for 5-ton lots per ton net f.o.r. or ex store, London. Supplies small.

"Nitro-Chalk."—£8 18s. per ton, in 6-ton lots, d/d farmer's nearest station, January/June delivery.

Concentrated Complete Fertilisers.—£11 18s. to £12 4s. per ton in 6-ton lots, d/d farmer's nearest station.

Ammonium Phosphate Fertilisers.—£11 14s. to £16 6s. per ton in 6-ton lots, d/d farmer's nearest station.

Coal Tar Products

Benzol.—Industrial (containing less than 2% of toluol), 2s. to 2s. 1d. per gal., ex works, nominal.

Carbolic Acid.—Crystals, 1s. 1d. per lb.; Crude, 60's, 3s. 7d. to 3s. 9d., according to specification. MANCHESTER: Crystals, 1s. 3d. per lb., d/d; crude, 4s. to 4s. 3d. naked, at works.

Cresote.—Home trade, 5d. per gal., f.o.r., makers' works; exports 6d. to 6½d. per gal., according to grade. MANCHESTER: 4½d. to 7d.

Cresylic Acid.—99/100%, 2s. 11d. to 3s. 3d. per gal., according to specification. MANCHESTER: Pale, 99/100%, 2s. 10d.

Naphtha.—Solvent, 90/100°, 1s. 8d. to 1s. 9d. per gal.; solvent, 95/160°, 1s. 11d. to 2s., naked at works; heavy 90/190°, 1s. 3d. to 1s. 5d. per gal., naked at works, according to quantity. MANCHESTER: 90/160°, 1s. 9d. to 1s. 11d. per gal.

Naphthalene.—Crude, whizzed or hot pressed, £10 to £11 per ton; purified crystals, £20 per ton in 2-cwt. bags; flaked, £21 5s. per ton. Fire lighter quality, £6 to £7 per ton ex works. MANCHESTER: Refined, £25.

Pitch.—Medium, soft, 40s. per ton, f.o.b. MANCHESTER: 37s. 6d., f.o.b. East Coast.

Pyridine.—90/140°, 19s. to 25s. per gal.; 90/160°, 16s. to 19s. 6d. 80/180°, 3s. 9d. to 4s. 6d. per gal., f.o.b. MANCHESTER: 18s. to 21s. per gal.

Toluol.—90%, 2s. 3d. per gal.; pure, 2s. 5d., nominal. MANCHESTER: Pure, 2s. 5d. per gal., naked.

Xylol.—Commercial, 2s. 9d. per gal.; pure, 2s. 11d. MANCHESTER: 2s. 11d. per gal.

Wood Distillation Products

Calcium Acetate.—Brown, £8 to £8 10s. per ton; grey, £12 to £13 MANCHESTER: Grey, £14.

Methyl Acetone.—40.50%, £42 per ton.

Wood Cresote.—Unrefined, 1s. to 1s. 3d. per gal., according to boiling range.

Wood Naphtha, Miscible.—3s. 7d. to 4s. per gal.; solvent, 4s. to 4s. 6d. per gal.

Wood Tar.—£5 to £6 per ton, according to quality.

*Intermediates and Dyes

Aniline Oil.—Spot, 8d. per lb., drums extra, d/d buyer's works.

Aniline Salts.—Spot, 8d. per lb., d/d buyer's works, casks free.

Benzaldehyde.—1s. 10d. per lb., for cwt. lots, net packages.

Benzidine, HCl.—2s. 7d. per lb., 100% as base, in casks.

Benzoic Acid, 1914 B.P. (ex toluol)—1s. 11d. per lb., d/d buyer's works.

m-Cresol 98/100%.—1s. 8d. to 1s. 9d. per lb. in ton lots.

o-Cresol 30/31° C.—8d. to 9d. per lb. in ton lots.

p-Cresol 34/35° C.—1s. 8d. to 1s. 9d. per lb. in ton lots.

Dichloraniline.—2s. 1½d. to 2s. 7d. per lb.

Dimethylaniline.—Spot, 1s. 7½d. per lb., package extra.

Dinitrobenzene.—8d. per lb.

Dinitrochlorobenzene, Solid.—£79 5s. per ton.

Dinitrotoluene.—48/50° C., 9d. per lb.; 66/68° C., 11½d.

Diphenylamine.—Spot, 2s. 3d. per lb.; d/d buyer's works.

Gamma Acid.—Spot, 4s. 4½d. per lb. 100%, d/d buyer's works.

H Acid.—Spot, 2s. 7d. per lb.; 100%, d/d buyer's works.

Naphthionic Acid.—1s. 10d. per lb.

β-Naphthol.—£97 per ton; flake, £94 8s. per ton.

α-Naphthylamine.—Lumps, 1s. 1d. per lb.

β-Naphthylamine.—Spot, 3s. per lb.; d/d buyer's works.

Neville and Winther's Acid.—Spot, 3s. 3½d. per lb. 100%.

o-Nitraniline.—1s. 3½d. per lb.

m-Nitraniline.—Spot, 2s. 10d. per lb. d/d buyer's works.

p-Nitraniline.—Spot, 1s. 10d. to 2s. per lb., in 90-gal. drums.

Nitrobenzene.—Spot, 4½d. to 5½d. per lb., in 90-gal. drums.

drums extra, 1-ton lots d/d buyer's works.

Nitronaphthalene.—10d. per lb.; P.G., 1s. 0½d. per lb.

Sodium Naphthionate.—Spot, 1s. 11d. per lb. 100%, d/d buyer's works.

Sulphanilic Acid.—Spot, 8½d. per lb. 100%, d/d buyer's works.

o-Toluidine.—11d. per lb., in 8/10 cwt. drums, drums extra.

p-Toluidine.—2s. per lb., in casks.

m-Xylidine Acetate.—4s. 5d. per lb., 100%.

Latest Oil Prices

LONDON.—March 28.—For the period ending May 4, per ton, net, naked, ex mill, works or refinery, and subject to additional charges according to package and location of supplies:—
LINSEED OIL, raw, £42 10s. **RAPESEED OIL**, crude, £44 5s. **COTTONSEED OIL**, crude, £31 2s. 6d.; washed, £34 5s.; refined edible, £35 12s. 6d.; refined deodorised, £36 10s. **SOYA BEAN OIL**, crude, £33; refined deodorised, £37. **COCONUT OIL**, crude, £28 2s. 6d.; refined deodorised, £31 7s. 6d. **PALM KERNEL OIL**, crude, £27 10s.; refined deodorised, £30 15s. **PALM OIL**, refined deodorised, £33. **GROUNDNUT OIL**, crude, £35 10s.; refined deodorised, £40. **WHALE OIL**, crude hardened, 42 deg., £30 10s.; refined hardened, 42 deg., £33. **ACID OILS**.—Groundnut, £24; soya, £22; coconut and palm kernel, £22 10s. **ROSIN**, 25s. to 35s. per cwt., ex wharf, according to grade. **TURPENTINE**, 54s. 9d. per cwt., spot, American including tax, ex wharf, barrels, and ex discount.

HULL.—March 27.—American turpentine, spot, 56s. per cwt., in barrels ex store.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

B. H. SAUNDERS AND CO., LTD., London, E., disinfectant manufacturers, etc. (M., 30/3/40.) February 29, £200 debenture to Mrs. E. T. Saunders, Chadwell Heath; general charge. *—, January 13, 1940.

JOHN E. WILLIAMS AND CO., LTD., Partington, paint manufacturers. (M., 30/3/40.) March 6, charge, to Barclays Bank, Ltd., securing all moneys due or to become due to the Bank; charged on works, Lavender Street, and Lower Moss Lane, Hulme, buildings and dwelling house, Wood Lane and 4 cottages, Cross Lane, Moss Lane, Partington, 105 Denmark Terrace, Moss Lane, West Hulme, 120 High Street, Bangor, 3c2 and 384 Stretford Road, Hulme, etc. *Nil. May 16, 1939.

POWELL AND SCHOLEFIELD, LTD., Liverpool, chemical manufacturers. (M., 30/3/40.) March 6, £675 mortgage, to Mrs. E. C. Jordan, Darlington; charged on 13 and 15 Cardwell Street, and 51 Sidney Place, Liverpool. *£2,266 (bankers). August 16, 1939.

B.P.S., LTD., London, N.W., manufacturers of cosmetics, etc. (M., 30/3/40.) March 12, series of £2,500 debentures, present issue £500; general charge; also March 12, £500 debentures, part of a series already registered. *£330. July 1, 1939.

HENRY KENYON AND CO., LTD., Warrington, spelter and chemical manufacturers. (M., 30/3/40.) March 14, mortgage to Midland Bank, Ltd., securing all moneys due or to become due to the Bank; charged on property at Bank Quay, Warrington, etc. *Nil. June 13, 1939.

County Court Judgments

RIXON, FELIX FERDINAND, 10 Arneliffe Avenue, Stockton-on-Tees. (C.C.J., 30/3/40.) Chemical engineer. £20 9s. 6d. February 15.

Declaration of Solvency Filed

ALLIANCE CARBIDE CO., LTD., Purley. (D.S.F., 30/3/40.) March 12.

Companies Winding-Up Voluntarily

HYSLOP, LIMITED. (C.W.U.V., 23/3/40.) Alfred Horsfield, of Messrs. Horsfield and Smith, Incorporated Accountants, 8 Manchester Road, Bury, appointed liquidator.

Satisfactions

COXETER AND SON, LTD., London, S.W., manufacturers of scientific instruments. (M.S., 30/3/40.) Satisfaction March 14, of debentures registered October 8, 1935, to extent of £1,000.

STONECOMBE LIME AND STONE CO., LTD. (M.S., 30/3/40.) Satisfaction March 12, £4,000, registered March 27, 1936.

Company News

Orders for the compulsory winding-up of the **Birmingham Colour Company, Ltd.**, and **Zet-Ozone (1938), Ltd.**, were made recently by Mr. Justice Crossman.

Viscose Development Co., Ltd., announce a net profit for 1939 of £21,268 (against £10,877 for 1938). A final dividend of 7 per cent. on ordinary shares will be paid, making 10 per cent. (against 7 per cent.).

Blythe Colour Works, Ltd., report a net profit for the year to December 31, of £38,831 (£30,154) after providing for depreciation. A final dividend of 15 per cent., less tax, compared with 12½ per cent., has been declared, making 20 per cent. (17½ per cent.).

Worthington-Simpson, Ltd., report a net profit of £37,241 for 1939 (against £26,256 for 1938). A dividend of 10 per cent. is recommended on the ordinary shares (against 7 per cent.) and £10,000 (against £5,000) is transferred to general reserve, leaving £19,327 to be carried forward (against £16,319).

Net profits of **British Oil and Cake Mills, Ltd.**—a member of the Lever Brothers and Unilever Group rose from £728,349 for 1938 to £735,063 for 1939. The ordinary dividend is unaltered at 9 per cent. The amount charged for tax before striking the profit was £50,232 (against £34,098). The carry-forward is £76,179 (against £60,614). There was a small fall in the output of the seed-crushing side of the business, but compound sales were well maintained. Since October 7 the company has been working under the control of the Ministry of Food.

New Companies Registered

Saneron, Ltd. (359,803).—Private company. Capital, £100 in 100 shares of £1 each. To carry on the business of wholesale and retail chemists and druggists, chemical engineers, sterilisers, dyers, cleaners, makers of chemical plant and materials, etc. Directors: Emily Klein, Adam Clark. Registered office: 71a Cricklewood Broadway, N.W.2.

Herbert Fromm, Ltd. (359,974).—Private company. Capital £5,000 in 5,000 shares of £1 each. To acquire the business of a merchant and manufacturer of chemists' goods and sundries carried on by H. Fromm at 29-31 Oxford Street, W.1, and to carry on the business of manufacturers of and dealers in rubber, balata, gutta-percha, vulcanite, ebonite and similar natural and synthetic substances, etc. Directors: Herbert Fromm, Frederic A. J. P. Wright. Solicitors: Willes Gladstone and Reid Sharnan, 4 Raymond Buildings, Gray's Inn, W.C.1. Registered office: 29-31 Oxford Street, W.1.

Chemical and Allied Stocks and Shares

ALTHOUGH there was little improvement in the amount of business passing on the Stock Exchange, the firmer trend in British Government securities influenced sentiment. Nevertheless the disposition is to adopt a cautious attitude, awaiting the Budget, which may have an important bearing on the market outlook. Shares of chemical and kindred companies were relatively steady, and movements in prices, although small, were mostly in favour of holders.

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Imperial Chemical were firmer at the better price of 31s. 10½d. on continued market hopes that the dividend may be kept on an 8 per cent. basis. Dunlop Rubber were around 33s. 3d. awaiting the results, which are also due shortly in this case. B. Laporte maintained their recent rise and changed hands up to 71s. 3d., while Fison Packard were again 40s. Blythe Colour 4s. ordinary, although "ex" the final dividend, were maintained at 7s. 9d. on the good results and the raising of the total distribution from 17½ per cent. to 20 per cent. British Match went back from 36s. 3d. to 36s., but Bryant and May preference made the higher price of 61s. 3d. Imperial Smelting ordinary maintained their recent rise to 13s. 7½d.

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British Oxygen were firm at 63s. 6d. on the increased profits and scrip bonus proposals, and British Aluminium, which also remained under the influence of the annual results, were 52s. 4½d. United Molasses were inclined to improve in anticipation of the next dividend announcement, but Turner and Newall had an easier appearance, as had Associated Cement, which were affected by the statements at the meeting. British Plaster Board 5s. ordinary

shares remained around 21s., but there was little activity in most shares of companies connected with the building and allied trades. On the other hand, slightly improved prices ruled for securities of iron and steel producers, attention being drawn to the apparently attractive yields and the prevailing market view that, despite E.P.T., prospects of dividends being maintained seem promising in most cases. Tube Investments, however, went back 9d. to 92s. 6d. British Celanese issues were better on hopes of an early announcement as to a payment in respect of dividend arrears on the second preference shares, while Courtaulds were slightly higher on balance, and Lancil ordinary had a steady appearance on market hopes of a higher dividend this year. Amalgamated Metal were around 20s. awaiting the dividend announcement, due shortly, while elsewhere General Refractories had a firmer appearance at 9s. on further consideration of the improved results. Cerebos and Reckitt ordinary shares made higher prices.

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Barry and Staines were slightly lower at 30s., but Nairn and Greenwich were steady at 57s. 6d., and Wall Paper deferred 17s. 6d. International Paint improved, and Pinchin Johnson were slightly better, awaiting the dividend announcement. Goodlass Wall were around 10s. Results of the last-named company fall to be issued in April. British Oil and Cake Mills preferred ordinary were steady at 41s. 3d., and Lever and Unilever were around 32s. 3d., awaiting the results, now imminent. Boots Drug changed hands around 42s. 9d. Beechams Pills 2s. 6d. deferred shares were steady at 8s. Timothy Whites kept at 26s., and British Drug Houses were again 23s. 9d. British Glues were quoted at 6s. 9d. Among oil shares slightly higher prices ruled for "Shell" and Burmah oil.

